WHAT IS CLAIMED IS:

Sub A17

1. In a single data communication channel, a multiple access method comprising steps of:

(a) receiving a data sequence to be transmitted, the data sequence comprising plural data symbols;

(b) producing a spread signal by modulating a first spreading code onto the data sequence; and

(c) transmitting the spread signal,

wherein the first spreading code spans a period of time which exceeds the time span of a data symbol.

2. The method of claim 1 further including performing the steps (a) through (c) for a plurality of first transmissions wherein for each of the first transmissions, the step of transmitting includes providing a preamble data sequence and modulating the preamble data sequence with a first preamble spreading code to produce a spread preamble signal.

3. The method of claim 2 further including performing the steps (a) through (c) for a plurality of second transmissions wherein for each of the second transmissions, the step of transmitting includes providing a second preamble data sequence and modulating the second preamble data sequence with a second preamble spreading code to produce a second spread preamble signal.

4. The method of claim 1 further including providing a second spreading code and performing the steps (a) through (c) for a plurality of transmissions, wherein some of the transmissions use the first spreading code and others of the transmissions use the second spreading code.

5. The method of claim 1 further including performing the steps (a) through (c) for a plurality of transmissions wherein for some of the transmissions a first spreading gain is used and for others of the transmissions a second spreading gain is used.

6. The method of claim 1 further including dividing the single communication channel into plural sub-channels and performing steps (a) through (c) for each sub-channel.

7. The method of claim 1 further including performing the steps (a) through (c) for a plurality of transmissions wherein for some of the transmissions the data sequence is received at a first data rate and for others of the transmissions the data sequence is received at a second data rate.

8. The method of claim 1 further including receiving transmissions from a base station that uses paired carrier multiple access signaling.

9. In a single communication channel, a multiple access method comprising:

providing a first spreading code;

receiving plural data sequences for transmission;

for at least one of the data sequences, generating a spread signal by modulating the data sequence with the first spreading code and transmitting the spread signal over the single communication channel,

wherein the first spreading code spans a period of time which exceeds the time span of a data symbol.

10. The method of claim 9 wherein the data sequences originate from different users.

11. The method of claim 9 wherein the step of transmitting includes providing plural preamble data sequences and modulating one or more of the preamble data sequences with a first preamble spreading code to produce plural spread preamble signals.

12. The method of claim 11 further including modulating one or more of the preamble data sequences with a second preamble spreading code.

13. The method of claim 12 wherein the step of modulating includes repeating the first preamble spreading code one or more times.

14. The method of claim 9 further including providing a second spreading code and, for at least one of the data sequences, generating a second spread signal by modulating the data sequence with the second spreading code and transmitting the second spread signal.

15. The method of claim 14 wherein the first spreading code has a first spreading gain and the second spreading code has a second spreading gain.

16. The method of claim 14 further including dividing the single communication channel into at least first and second sub-channels and transmitting the first spread signal over the first sub-channel and the second spread signal over the second sub-channel.

17. The method of claim 9 wherein the step of receiving plural data sequences includes receiving first data sequences having a first data rate and receiving second data sequences having a second data rate.

18. The method of claim 9 further including receiving transmissions from a base station that uses paired carrier multiple access signaling.

19. In a single data communication channel, a method for providing multiple access to the channel comprising:

providing plural transmitters;

providing an identical first spreading code in each of the transmitters; and

in each transmitter: receiving a data sequence, spreading the data sequence using the first spreading code to produce a spread signal, and transmitting the spread signal,

wherein the first spreading code spans a period of time which exceeds the time span of a data symbol.

20. The method of claim 19 wherein the step of transmitting includes: providing a preamble data sequence; modulating the preamble data sequence with a first preamble spreading code in some of the transmitters to produce a spread preamble signal; and transmitting the spread preamble signal.

21. The method of claim 20 wherein the step of modulating the preamble data sequence in others of the transmitters uses a second preamble spreading code.

22. The method 19 further including:

providing plural additional transmitters;

providing an identical second spreading code in each of the additional transmitters; and

in each of the additional transmitters: receiving a data sequence, spreading the data sequence using the second spreading code to produce a spread signal, and transmitting the spread signal.

23. The method of claim 22 wherein the first spreading code has a first spreading gain and the second spreading code has a second spreading gain.

24. The method of claim 19 wherein the step of receiving a data sequence in one of the transmitters includes receiving the data sequence at a first data rate, and the step of receiving a data sequence in another of the transmitters includes receiving the data sequence at a second data rate.

25. The method 19 further including:

dividing the single communication channel into at least two sub-channels;

providing plural additional transmitters;

providing an identical second spreading code in each of the additional transmitters; and

in each of the additional transmitters: receiving a data sequence, spreading the data sequence using the second spreading code to produce a spread signal, and transmitting the spread signal over one of the sub-channels.

26. The method of claim 19 further including receiving transmissions from a base station that uses paired carrier multiple access signaling.

27. In a single data communication channel, a multiple access method comprising steps of:

(a) receiving a data sequence to be transmitted, the data sequence comprising plural data symbols;

(b) producing a spread signal by modulating a first spreading code onto the data sequence; and

(c) transmitting the spread signal,

wherein the first spreading code does not repeat during the step of modulating the data sequence.

28. The method of claim 27 wherein the data sequence spans a period of time that does not exceed a value T and the first spreading code spans a period of time exceeding T.

29. The method of claim 27 further including performing the steps (a) through (c) for a plurality of first transmissions wherein for each of the first transmissions, the step of transmitting includes providing a preamble data sequence and modulating the preamble data sequence with a first preamble spreading code to produce a spread preamble signal.

30. The method of claim 29 further including performing the steps (a) through (c) for a plurality of second transmissions wherein for each of the second transmissions, the step of transmitting includes providing a second preamble data sequence and modulating the second preamble data sequence with a second preamble spreading code to produce a second spread preamble signal.

31. The method of claim 27 further including providing a second spreading code and performing the steps (a) through (c) for a plurality of transmissions, wherein some of the transmissions use the first spreading code and others of the transmissions use the second spreading code.

32. The method of claim 27 further including performing the steps (a) through (c) for a plurality of transmissions wherein for some of the transmissions a first spreading gain is used and for others of the transmissions a second spreading gain is used.

33. The method of claim 27 further including dividing the single communication channel into plural sub-channels and performing steps (a) through (c) for each sub-channel.

34. The method of claim 27 further including performing the steps (a) through (c) for a plurality of transmissions wherein for some of the transmissions the data sequence is received at a first data rate and for others of the transmissions the data sequence is received at a second data rate.

35. The method of claim 27 further including receiving transmissions from a base station that uses paired carrier multiple access signaling.

36. In a single communication channel, a multiple access method comprising:

providing a first spreading code;

receiving plural data sequences for transmission;

producing plural spread signals by modulating some of the data sequences with the first spreading code, wherein the spreading code does not repeat during the step of modulating; and

transmitting the spread signals over the single communication channel.

37. The method of claim 36 wherein the data sequences originate from different users.

38. The method of claim 36 wherein each data sequence comprises at most N bits and wherein the first spreading code comprises at least N x g chips, where g is process gain.

39. The method of claim 36 wherein the step of transmitting includes providing plural preamble data sequences and modulating one or more of the preamble data sequences with a first preamble spreading code to produce plural spread preamble signals.

40. The method of claim 39 further including modulating one or more of the preamble data sequences with a second preamble spreading code.

41. The method of claim 40 wherein the step of modulating includes repeating the first preamble spreading code one or more times.

42. The method of claim 36 further including providing a second spreading code, wherein the step of producing plural spread signals includes modulating some of the data sequences with the second spreading code.

43. The method of claim 42 wherein the first spreading code has a first spreading gain and the second spreading code has a second spreading gain.

44. The method of claim 42 further including dividing the single communication channel into at least first and second sub-channels, and transmitting the

first spread signal over the first sub-channel and the second spread signal over the second sub-channel.

45. The method of claim 36 wherein the step of receiving plural data sequences includes receiving first data sequences having a first data rate and receiving second data sequences having a second data rate.

46. The method of claim 36 further including receiving transmissions from a base station that uses paired carrier multiple access signaling.

47. In a single data communication channel, a method for providing multiple access to the channel comprising:

providing plural transmitters;

providing an identical first spreading code in each of the transmitters; and

in each transmitter: receiving a data sequence, spreading the data sequence using the first spreading code to produce a spread signal wherein the spreading sequence does not repeat;

and transmitting the spread signal.

48. The method of claim 47 wherein the first spreading code spans a period of time which exceeds the time span of the longest data sequence in any of the transmitters.

49. The method of claim 47 wherein the step of transmitting includes: providing a preamble data sequence; modulating the preamble data sequence with a first preamble spreading code in at least some of the transmitters to produce a spread preamble signal; and transmitting the spread preamble signal.

50. The method of claim 49 wherein the step of modulating the preamble data sequence in some of the transmitters uses a second preamble spreading code.

51. The method 47 further including:

providing plural additional transmitters;

providing an identical second spreading code in each of the additional transmitters; and

in each of the additional transmitters: receiving a data sequence, spreading the data sequence using the second spreading code to produce a spread signal, and transmitting the spread signal.

52. The method of claim 51 wherein the first spreading code has a first spreading gain and the second spreading code has a second spreading gain.

53. The method of claim 47 wherein the step of receiving a data sequence in one of the transmitters includes receiving the data sequence at a first data rate, and the step of receiving a data sequence in another of the transmitters includes receiving the data sequence at a second data rate.

54. The method 47 further including:

dividing the single communication channel into at least two sub-channels;

providing plural additional transmitters;

providing an identical second spreading code in each of the additional transmitters; and

in each of the additional transmitters: receiving a data sequence, spreading the data sequence using the second spreading code to produce a spread signal, and transmitting the spread signal over one of the sub-channels.

55. The method of claim 47 further including receiving transmissions from a base station that uses paired carrier multiple access signaling.

56. In a system for providing multiple access over a single communication channel, a transmitter comprising:

an input component configured to receive plural data sequences;

a memory store configured to contain a first spreading code, wherein the first spreading code comprises more than g chips, where g is the processing gain;

a processing component in data communication with the memory store and configured to modulate the data sequence with the first spreading code to produce a spread signal; and

a transmission component configured to transmit the spread signal as a data burst.

57. The transmitter of claim 56 wherein the data sequences each comprise at most N bits and the first spreading code comprises more than N x g chips.

58. The transmitter of claim 56 wherein the memory component is further configured to contain a data preamble and a preamble spreading code and the processing component is further configured to modulate the data preamble with the preamble spreading code.

59. The transmitter of claim 58 wherein the processing component is further configured to modulate the data preamble with the preamble spreading code by repeating the preamble spreading code one or more times.

60. The transmitter of claim 56 wherein the memory store is further configured to contain a second spreading code and the processing component is further configured to modulate the data sequences with either the first or the second spreading code.

61. The transmitter of claim 60 wherein the first and second spreading codes each spans a period of time greater than the time span of the longest data sequence.

62. The transmitter of claim 60 wherein the first and second spreading codes have different spreading gains.

63. The transmitter of claim 56 wherein some data sequences are received at a first data rate and other data sequences are received at a second data rate.

64. The transmitter of claim 56 further including a receiver component for receiving signals transmitted by paired carrier multiple access signaling.

65. A system for providing multiple access over a single communication channel, comprising:

a base station; and

plural transmitters, each configured to transmit data bursts to the base station in an asynchronous manner,

each transmitter further configured to:

(i) receive a data sequence of at most N bits in length;

(ii) contain a spreading code, the spreading code comprising more than g chips, where g is the processing gain;

(iii) modulate the data sequence with the spreading code to produce a spread signal; and

(iv) transmit the spread signal as a data burst.

66. The system of claim 65 wherein the spreading code comprises more than N x g chips.

67. The system of claim 65 wherein each transmitter is further configured to contain a data preamble and a preamble spreading code and further configured to modulate the data preamble with the preamble spreading code.

68. The system of claim 67 wherein each transmitter is further configured to modulate the data preamble with the preamble spreading code by repeating the preamble spreading code one or more times.

69. The system of claim 65 wherein each transmitter is further configured to receive the data sequence at a first data rate, the system further including plural additional transmitters, wherein each additional transmitter is configured to receive data sequences at a second data rate different from the first data rate.

70. The system of claim 69 wherein the transmitters and the base station are not configured to perform chip alignment or bit alignment.

71. The system of claim 65 wherein the base station is not configured with a multi-user detection component.

72. The system of claim 65 wherein the base station transmits to the transmitters using a paired carrier multiple access technique.

73. In a system for providing multiple access over a single communication channel, a receiver comprising:

a digital signal representing a received data burst;

a data bus, the digital signal being fed to the data bus;

a control bus;

a preamble detection component coupled to the control bus, the data signal further being fed to the preamble detection component, the preamble detection component configured to detect preambles using a first spreading code;

plural demodulation circuits, each coupled to the data bus and to the control bus, each configured to produce a data stream from data received over the data bus; and

a selection component operatively coupled to the preamble detection component and coupled to the control bus, the selection component configured to select an available demodulation circuit,

wherein one of the demodulation circuits operates on data in response to control signals issued by the preamble detection component and by the selection component, so that multiple data bursts received by the preamble detection component can be concurrently processed by selected ones of the demodulation circuits.

74. The receiver of claim 73 further including plural additional preamble detection components, each configured to detect preambles using a spreading code different from the spreading code of the other preamble detection components, each coupled to receive the data signal, each coupled to the data bus, each coupled to the selection component.